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Fall 2007

Veterinary Vision, Fall 2007

Claire Eldridge
Managing Editor

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Veterinary VISION

A Publication of the University of Tennessee College of Veterinary Medicine Volume 6/Number 1

fall 2007

E.coli
Botulism

Foot and Mouth Disease
Salmonella **Avian Flu**

Shigellosis

Malaria

Cholera

HIV/AIDS

In public health, if you're doing your job, nothing happens!

Do our diet choices and the medications we take affect our ability to fight cancer?

Protecting America's infrastructure: Supporting national efforts to protect America's agriculture and food supply.

Dengue Fever

THE UNIVERSITY of
TENNESSEE
Institute of Agriculture
www.vet.utk.edu



Increasing the Veterinary College's Role in Public Health

The general public tends to think of veterinary medicine only in terms of preventing disease in animals; however, the profession also exists to prevent disease in animals and in humans. Veterinary medicine, in fact, is the only comparative medicine profession.

The online encyclopedia Wikipedia defines the comprehensive thrust of the veterinary medicine mission thus: Veterinary medicine is the application of medical, diagnostic, and therapeutic principles to companion, domestic, exotic, wildlife, and production animals. Veterinary science is vital to the study and protection of animal production practices, herd health and monitoring the spread of disease. It requires the acquisition and application of scientific knowledge in multiple disciplines and uses technical skills directed at disease prevention in both domestic and wild animals.

Veterinary science helps safeguard human health through the careful monitoring of the health of livestock, companion animals, and wildlife. Emerging zoonotic diseases around the globe require capabilities in epidemiology and infectious disease control that are particularly well suited to veterinary sciences. The Veterinarian's Oath notably includes the statement that we will use our scientific knowledge and skills for the benefit of society and that we will promote public health.

Veterinary medicine has experienced an extraordinary evolution from the days when it had primarily an agriculture focus to the present. Today, in addition to helping to ensure a safe and abundant source of animal protein and fiber, there is a major focus on the mental, physical, and environmental health and well-being of humans. Let me remind you that as many as one half of all infectious diseases affecting humans are zoonotic, and fully 75 percent of all infectious diseases of most concern today due to bio- and agro-terrorism are zoonotic. Because many of our efforts are directed at prevention of disease transmission from animals to humans, we are comparative medicine and public health professionals in the truest sense.

While veterinarians and public health professionals have crossed paths for years, it is only recently that faculty and students from colleges of veterinary medicine and schools of public health have come together in a symposium focused on building collaboration between our professions in the areas of education, workforce training, policy development, and research. The recent national pet food recall is only one example demonstrating the immediate need for collaboration between the two professions. Once the ingredients that contaminated the pet food spread into the human food chain, the recall became a public health issue, in addition to a veterinary medical issue.

Increasingly, federal agencies are providing a platform for the two professions to work together. Some top employers of veterinarians in public health are two agencies of the Department of Agriculture—the Food Safety and Inspection Service and the

Animal and Plant Health Inspection Service—and the Department of Defense. There is, however, a serious shortage of veterinarians in the public health sector. As many as 3,000 to 6,000 veterinarians would be needed if we had to respond to a major agricultural animal health emergency, according to animal health officials.

Colleges and schools of veterinary medicine must include more public health courses in their curricula and cooperate with schools of public health to explore ways in which the two professions can better work together for the benefit of society. We must collaboratively focus on four areas: academics, research, pipeline and workforce, and public policy development, including a system of organized approaches and cooperative agreements to fully integrate the two professions at the state and federal levels. We must address recruitment and training and continuing education, as well as incentives such as loan forgiveness programs and scholarships. We must develop joint degree programs, such as The

University of Tennessee's parallel DVM/MPH (Doctor of Veterinary Medicine/ Master of Public Health) degree program and examine accreditation systems for relevance to societal needs. We must further our research into zoonotic and emerging infectious diseases, foodborne and waterborne illnesses, environmental and ecosystem health issues, and the human-animal bond.

Given its comparative medicine goals, the veterinary medicine curriculum is very dense. The perennial question is how to adjust the various curricula of veterinary medicine to meet the broad and diverse needs of society. I believe the solution will include targeted curricula delivered through regional models and collaborations, including the schools of public health and the public health community. As we continue to advance companion animal medicine, we must also succeed in refocusing on food-animal medicine and public health. Failure to do so can threaten the well-being of all mankind.

I invite you to read this issue of *Veterinary Vision* and reflect on what The University of Tennessee's College of Veterinary Medicine is doing and planning to meet national and global public health needs.

To all of our supporters: On behalf of all us in the College of Veterinary Medicine, thank you for your generosity with your time, talents, gifts, and spirit. We are deeply grateful for your commitment to building our future together. ■



Dean Blackwell is the 2007 recipient of the U.S. Food and Drug Administration (FDA) Distinguished Alumni Award in recognition of his continuing, meaningful support of the FDA's mission and his career-long dedication to protecting public health. Blackwell became Chief Veterinarian of the USPHS and Deputy Director of the FDA's Center for Veterinary Medicine during his 23 years of active duty with the Commissioned Corps of the U.S. Public Health Service (USPHS). He retired as Assistant Surgeon General and chief of the Office of the Surgeon General before becoming Dean of UTCVM in 2000.

Michael J. Blackwell, DVM, MPH, Dean



Veterinary vision

Volume 6/Number 1/Fall 2007
A Publication of

The University of Tennessee
College of Veterinary Medicine
2407 River Drive
Knoxville, TN 37996-4550

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E18-1701-002-001-08

A project of the UT College of Veterinary Medicine, with assistance from UTIA Marketing and Communications Services, 865/974-7141.

Managing Editor:
Dr. Claire Eldridge

Chief Writer:
Sandra Harbison

Contributors:
Karen Armsey
Dr. Seung Joon Baek
Misty Bailey
Dr. Claire Eldridge
Dr. William Hill
Dr. Nancy Howell
Teresa Jennings
Dennis Jones
Dr. India Lane
David Smelser
Dr. Elizabeth Strand

Editor:
Elise LeQuire

Photographers:
Greg Hirshoren
Dr. Nancy Howell
Teresa Jennings
Phillip (Phil) Snow

Designer:
Gary Dagnan

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ON THE COVER:
The globe depicts the 'top ten' infectious diseases by continent, based on June 2007 monitoring by the World Health organization (WHO).

In Public Health, if You're Doing Your Job, Nothing Happens

One of the pillars of the veterinarian's oath is to promote public health, and public health demands, whether in food animal medicine, food safety, or protecting humans against zoonotic diseases.



AIDS, West Nile Virus, SARS, avian influenza, monkey pox, Ebola, E. coli, Salmonella. Think veterinarians don't have anything to do with public health? Think again. Human health is linked to animal health. Modern veterinary medicine has its roots in France at a time when a healthy military horse could make the difference between victory and defeat in battle. Today, veterinarians are on the front lines of defense in matters of national security.

Over the last 25 years, a number of diseases have made people aware that as medical professionals, veterinarians help safeguard the interface between humans and animals. According to the Centers for Disease Control and Prevention (CDC), almost 75 percent of emerging infectious diseases in humans are zoonotic, potentially passed from animals to humans. Several zoonotic diseases are included in the high risk category of agents that pose a risk to national security because, even though they may have an animal source, they can be easily transmitted from person to person and have high mortality rates. High-risk agents with the potential to be weaponized by bioterrorists include anthrax, brucellosis, plague, tularemia, and viral hemorrhagic fevers.

Surveillance, Education, and Public Health

One of the veterinarian's responsibilities, outlined in the oath taken upon graduation, is to promote public health. Public health demands—whether in food animal medicine, food safety, or protecting humans against zoonotic diseases—continue to grow. Public health is a function of every kind of practice in which a veterinarian engages. While most think of veterinarians as small animal practitioners treating dogs and cats, they also prevent diseases that might be transmissible to humans such as rabies, brucellosis, tuberculosis, leptospirosis, Lyme disease, cat scratch disease, or Rocky Mountain Spotted Fever. Veterinarians also play a role in educating the public on issues such as dog

bite prevention and how to maintain a healthy companion animal.

Dr. Michael Blackwell, dean of the UTCVM, served 23 years on active duty with the Commissioned Corps of the U.S. Public Health Service, and retired as Assistant Surgeon General and Chief of Staff of the Office of the U.S. Surgeon General before coming to Tennessee. He says veterinarians are trained to survey and monitor diseases in animals with potential to spread to humans in order to notice problems as they develop.

Veterinarians have access to an extensive laboratory system that allows a problem to be rapidly diagnosed, and they can exercise a rapid appropriate response such as issuing an order to quarantine animals. "Veterinarians graduate with the only comparative medicine degree that is awarded," says Blackwell. "Without the veterinary profession, we would live under the same conditions as a third world country with extreme parasitism, increased incidence of viral infections, and a lower quality food supply which would put us at an increased risk of illness."

UTCVM is educating tomorrow's veterinary public health professionals, training key individuals in the nation's agricultural industry to improve food safety and security, and preventing the spread of disease between animals and people.

UTCVM Dean Michael Blackwell has been named to the One Health Initiative Task Force, a national effort in strengthening the relationship between animal and human medicine, led by the American Veterinary Medical Association (AVMA) and the American Medical Association (AMA). Blackwell is one of twelve members selected from the animal and human medical communities. The AVMA has charged the task force with articulating a vision of one health that will enhance the integration of animal, human, and environmental health for the mutual benefit of all.

Outbreak

Driving down a lonely road in southern California, Dr. John New had an “aha” moment. “There’s something to this epidemiology business.”

Fresh out of veterinary school and newly commissioned as an officer in the U.S. Army Veterinary Corps, New had been sent to help with an outbreak of Newcastle disease, a highly contagious fatal disease of chickens and other birds that had been accidentally introduced into the state’s poultry industry. Until that time, he had primarily worked in small animal practice. “I learned about epidemiology in vet school but hadn’t paid much attention to it. With that outbreak, I saw the principles of epidemiology being applied in a field setting—and they were making a difference. If you identify the factors that influence disease and impact those factors, you can reduce the transmission of the disease and under some circumstances eradicate it from the area. When it came time to leave the Army, I decided to work on a public health degree. I wanted to be an epidemiologist.”

Epidemiologists look at factors related to disease, whether genetic, environmental, a characteristic of the animal or person, or a circumstance of place and time. They study the population whereas clinical medicine focuses on the individual. “The population is its own organism,” says New. “If you can learn to recognize patterns of disease or behavior or some other factor in the population, then you can ultimately design some interventions to prevent the disease and promote health.”

New, diplomate of the American College of Veterinary Preventive Medicine and head of the Comparative Medicine Department, came to UTCVM more than 30 years ago, before the college had a clinic. He’s excited the college has a strong public health program that continues to grow. “Because of our dean’s vision, we have turned a rather modest program around and are now one of 16 programs in the country with a focus on veterinary public health. We continue to grow every year.”

Parallel Specialties Converge

In 2004, UTCVM collaborated with the UT College of Education, Health, and Human Sciences to establish a veterinary concentration in an existing Master of Public Health program. As of June 2007, 22 veterinarians or veterinary students have enrolled in the program. The first three vet students to enroll in the parallel DVM/MPH program are scheduled to graduate in December.

Share the Wealth

To Aaron Copland, *Appalachian Spring* rang a bell, but summer in the Appalachians struck a cord with epidemiologists. Dr. Agricola Odoi, assistant professor of Epidemiology in UTCVM’s Department of Comparative Medicine, worked with faculty and staff from East Tennessee State University, University of Alabama School of Public Health, and the Southeast Public Health Training Center at the University of North Carolina to provide advanced epidemiology training during the 2007 Appalachian Summer Institute of Epidemiology. The weeklong program tapped into international as well as national expertise.

Dr. Odoi’s current research and teaching interests are in the epidemiology of food and waterborne diseases of public health significance and the applications of Geographic Information System (GIS) and Spatial Epidemiology in public and population health research and practice. He says the intensive epidemiology program provided a unique opportunity for graduate students. “Every school of public health may not be able to offer every course that its students need,” he says. “Students from different educational institutions were able to take courses they otherwise wouldn’t have been exposed to at their home institutions.” The program also provided continuing education opportunities for health professionals.



Odoi (left), originally from Uganda, joined UTCVM in Fall 2005, in part because of the college’s interest in increasing veterinarians’ role in addressing issues of public health significance. Pictured with Dr. Odoi are Drs. John New and Bart Rohrbach.



Dr. Matt Welborn was one of the first veterinarians to receive his MPH/VPH in the program. He has also become a diplomate of the American College of Veterinary Preventive Medicine after successfully completing the three required board examinations. Since then, he has moved from the Large Animal Clinical Sciences Department at the college to Comparative Medicine to help coordinate the Veterinary Public Health Concentration and to assist the Center for Agriculture and Food Security and Preparedness.

Drs. Sarah Alexander, Rachel Alley Radcliffe, and Sarah Zika received their DVMs in May 2007. Since then, they have been completing additional coursework and an internship experience required for the MPH. Alexander worked with the food-borne illness section of the CDC, Radcliffe worked with the rabies section of the CDC, and Zika worked with veterinarians studying respiratory diseases with the CDC.

Needs and opportunities for veterinarians are expanding rapidly in organizations ranging from public agencies dealing with animal and human health, to agencies and corporations charged with food safety and security from the farm to the consumer level. As the demand for veterinarians with training in food safety, food and animal production, zoonotic diseases, biosecurity, research methods, health education, and public policy increases, the MPH degree becomes even more desirable as an adjunct to the DVM.

Dr. Bart Rohrbach, diplomate with the American College of Veterinary Preventive Medicine and associate professor in Comparative Medicine, coordinated a Web-based graduate course, "Zoonoses for the Public Health Practitioner." Nearly three out of every four emerging diseases reach humans through animals. Overshadowing the occurrence of these diseases is the continuing risk of bioterrorism. When new diseases are discovered or when known diseases begin to spread, an early question public health and other authorities ask is whether the diseases represent an intentional introduction.

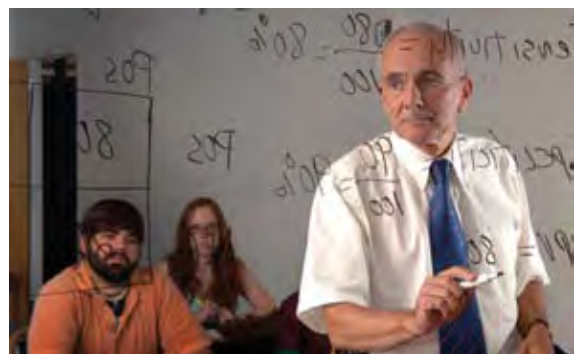


Chattanooga Creek Superfund Site

UTCVM's Dr. Patricia Tithof and other researchers are studying the effects of environmental pollutants, specifically polycyclic aromatic hydrocarbons (PAHs) at this site designated by the Environmental Protection Agency as one of its 'most hazardous sites' on its National Priorities List. PAHs are found in coal tar mixtures. Data collected from this site suggest that PAHs present there could exert potentially harmful effects on the cardiovascular system of both animals and humans who live there.

Teamwork Promotes One Health

Human doctors are joining forces to promote human health. The American Veterinary Medical Association and the American Medical Association recently announced a partnership to strengthen the relationship between animal and human medicine through the One Health Initiative.



Dr. Bart Rohrbach

UTCVM's Blackwell, along with 12 other members of the animal and human medical communities, will lead a national effort to articulate a vision of one health that enhances the integration of animal, human, and environmental health for the mutual benefit of all. New says the One Medicine Initiative is not new, but is beginning to be appreciated. "There's no way a physician's education can cover all aspects of public health. Medical students, for example, may receive a mere 30-minute lecture on rabies. MDs need to partner with vets in their community to best serve the community."

New says the team approach combining nursing, MDs, vets, and environmental health specialists among others is more than efficient. "Using that model you start getting a first-class public health team." The college is involved in a local public health forum where veterinary faculty, public health faculty, family practice physicians, and county and regional health departments meet quarterly for presentations and to exchange information on various topics. UTCVM continues to strengthen its role in the local, national and global public health arenas. **M**

The China Connection

The UTCVM International Multi-Task Cooperative and Exchange Program with China fosters an educational exchange between the U.S. and China. In early December, 2007, Dr. Chris Egger will travel to Beijing to learn about eastern medicine as she offers training in pain management. Tennessee Governor Phil Bredesen has invited Dean Michael Blackwell to join his delegation as they travel to China this fall on a trade mission. Officials from China, recognizing the need to strengthen the country's public health infrastructure, have asked UTCVM to provide a public health short course which CVM's Dr. John New will deliver in 2008. In short, UTCVM will be a major force in the development of veterinary medicine and its role in public health in China.

At the interface of public health:

Alumnus at the Centers for Disease Control and Prevention tackles HIV/AIDS

This Knoxville native has been interviewed by NPR, CNN, *The New York Times*, *The Boston Globe*, and *The Washington Post*. He's worked on Ebola virus, Legionnaires' disease, Hepatitis C, and other diseases such as Bordetella bronchiseptica. How did this veterinarian end up working on HIV/AIDS at the CDC? "My focus changed over time in vet school," says Dr. Patrick Sullivan (UTCVM '92). "The clinical veterinary practice interested me, but when I was exposed to basic science research and public health—the interface among the three really excited me."

Two years after receiving his veterinary degree, Sullivan earned a Ph.D. in comparative and experimental medicine, which is the study of disease processes common in animals and humans. His graduate work, focused on hematological problems associated with AIDS, serves him well as chief of the Behavioral and Clinical Surveillance Branch in the Division of HIV/AIDS Prevention at CDC. Simply put, the branch implements HIV surveillance systems and research studies in the United States and other countries. "We study behaviors that put people at risk for HIV, and what we learn improves our programs for helping people reduce their risks," says Sullivan. "We also look at new diagnostic testing approaches for HIV in an effort to increase the numbers of people who have HIV detected." An important task, since the CDC estimates that, of the one million people living with HIV in the United States, one fourth do not know they have the disease and could unknowingly spread it.

"Being in the CDC's HIV program is not where I thought I would end up when I left Knoxville, but it's turned out to be very rewarding," Sullivan says, adding he's come to appreciate that veterinarians graduate uniquely trained to do public health. "Public health requires scientists to take a population level view. Learning about production medicine and herd health requires veterinarians to examine how various programs and preventions can affect the big picture."

Even if they don't pursue a career in public health, Sullivan says veterinarians should exercise a public health mindset in private practice. "Understand that, as a veterinarian in practice, you could see the first signs of something that could affect public health—the canary in the coal mine." **M**



Dr. Patrick Sullivan, UTCVM, '92

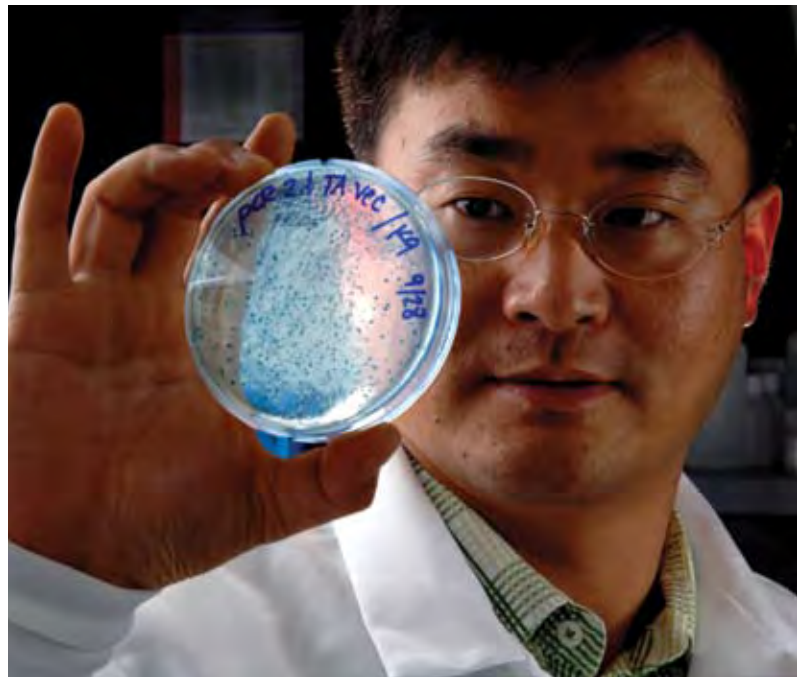
Could our diet choices and the medications we take for pain and diabetes also affect our ability to fight cancer?

NSAIDs, PPAR γ ligands, and phytochemicals

Cancer is second only to heart disease as the leading cause of death in the United States, and colorectal cancer is one of the most prevalent causes of cancer-related mortality in the western world (14). Remarkable progress in the treatment of colorectal cancer has been made in the last two decades. The survival rate is now better than 90 percent for the patients with Stage I, localized disease. However, it is estimated that around 50,000 people die of colorectal cancer each year, and it is still the third most common cancer-related disease in both men and women. These deaths are largely because an optimal method for early detection remains unknown. This lack of knowledge has led to the development of complementary strategies such as chemoprevention to reduce morbidity and mortality from colorectal cancer (3). Three potential chemopreventive compounds are being extensively investigated in my laboratory: NSAIDs, PPAR γ ligands and phytochemicals.

NSAIDs

Nonsteroidal anti-inflammatory drugs (NSAIDs) like ibuprofen and aspirin are widely used in the treatment of inflammatory disease. Their anti-inflammatory effects are believed to result from the inhibition of cyclooxygenase (COX), of which two types exist: COX 1 and COX 2. COX 1 is constitutively expressed in many tissues, while COX2 expression is regulated by tumor promoters and proteins that encourage cellular change, division, and proliferation. It has recently been reported that the long-term use of NSAIDs, inhibitors of COX, may prevent not only colorectal cancers but also a number of other cancers. This hypothesis has been firmly established by numerous population-based studies and was recently confirmed in two large,



Dr. Seung Joon Baek, Assistant Professor, Department of Pathobiology. Dr. Baek is a molecular biologist whose research was recognized in May 2007 with a UTK Chancellor's Award for Professional Promise in Research and Creative Achievement. Dr. Baek also received the 2007 Pfizer Animal Health Award for Research Excellence. Dr. Baek's research focuses on identifying the subcellular mechanisms responsible for the chemo-preventive effects of specific drugs and natural compounds on cancer.

randomized, clinical trials with the pro-drug sulin-
dac and the selective COX-2 inhibitor, Celebrex.

The results from these investigations showed these drugs inhibit the growth of polyps and cause regression of existing polyps in patients with familial adenomatous polyposis (FAP) (8,22). In vitro studies with human colorectal cells and studies with animal models have also provided additional evidence for the chemopreventive activity of NSAIDs.

For example, sulindac sulfide, the active metabolite of sulindac, is particularly effective in colon cancer models (2, 5).

Considerable data, from animal models and in vitro studies to numerous epidemiologic and clinical trials, support the use of these drugs as effective anti-cancer agents. The target molecules that mediate chemopreventive effects, however, are not clearly understood. Therefore, identifying possible targets is important to understanding the mechanism of the chemopreventive actions. One hypothesis is the obvious involvement of COX-2 inhibition, but it is clear that COX-independent mechanisms are also involved. A number of studies have identified potential target genes, including NAG-1, ATF3, EGR-1, and other tumor suppressor proteins.

PPAR γ and its ligands in anti tumorigenesis

Many cancers have been linked to heredity and/or the environment, which can either enhance or inhibit abnormal cell growth. One such molecular link to the environment is peroxisome proliferator activated receptors (PPAR). PPAR are nuclear hormone receptors activated by specific endogenous and exogenous ligands (20). Ligand activation of PPAR γ regulates fat cells and promotes lipid storage in mature fat cells. The ability of PPAR γ to regulate cellular change and proliferation has inspired a number of researchers to explore the use of PPAR γ agonists as chemotherapeutic agents (12, 17).

PPAR γ is highly expressed, and its ligands induce programmed cell death and growth inhibition in various human tumor cell lines including breast (11), lung (4), colon (18, 19), prostate (9), bladder (6), and stomach (21). In support of in vitro data, there are now a number of reports documenting tumor growth suppression/arrest in tumor-bearing rodent models treated with PPAR γ ligands. For example, troglitazone (TGZ) treatment of human papillary thyroid tumors in immuno-deficient mice reduced tumor growth and prevented distant metastasis (13). Both estrogen dependent (MCF-7) and independent (MDA-MB-231) human breast cancer cell lines undergo cell cycle arrest when treated with TGZ or prostaglandin J₂, and similar effects are observed in rodent breast cancer models (15, 23). However, TGZ, also an anti-diabetic drug, was voluntarily withdrawn from the market in March 2000 because it caused severe idiosyncratic liver injury.

A new class of thiazolidinediones, MCC-555 (also known as KRP-297 and RWJ-241947), has been subsequently established as a novel anti-diabetic drug in animal models of type II diabetes. Like other thiazolidinediones, MCC-555 binds to PPAR γ and affects its transcriptional activities, but its binding affinity for PPAR γ is relatively weak. Treatment with MCC-555 profoundly suppressed growth of PC-3 prostate cancer xenografts in BNX mice, and the remaining tumor tissue had prominent cell death, fibrous degeneration, and inflammatory/giant cell reactions (10).

We have also shown that MCC-555 reduces polyp number in the genetic Min mouse model, which carries a mutation in APC tumor suppressor gene. This study also suggests MCC-555 works in a MAP kinase dependent manner, indicating that

PPAR γ ligands could impact tumor cell growth and progression independent of PPAR γ .

Cancer is second only to heart disease as the leading cause of death in the United States, and colorectal cancer is one of the most prevalent causes of cancer-related mortality in the western world.

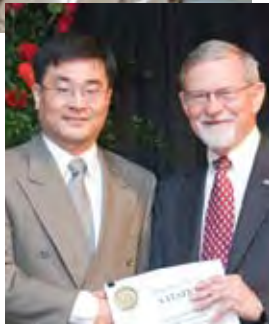
Phytochemicals on anti-cancer effects

Epidemiological studies have suggested that nutrition plays an important role in carcinogenesis, and dietary factors have been estimated to account for up to 80 percent of cancers of the gastrointestinal tract. Approximately 30 percent of cancer morbidity and mortality might be prevented with proper adjustment of diets (7, 16). Phytochemicals are found in dietary plant products, including fruits, vegetables, beverages, and herbs and spices. A number of these compounds have been found to inhibit tumorigenesis in animal models and/or exhibit potent biological properties. In addition, epidemiological studies indicate that populations consuming foods rich in specific phytochemicals have lowered incidence of cancer, heart disease, and osteoporosis. We have been studying several phytochemical compounds, including resveratrol, genistein, green tea catechins, gingerol, and indol compounds for use in the chemoprevention of human colorectal cancer.

Some of these compounds induce the p53 tumor suppressor protein in colorectal cancer cells, thereby inducing several genes that in turn induce cancer cell death. Many other groups have also reported induction of cancer cell death and inter-



Members of Dr. Baek's research team are (l to r): Jay Bahn, Drs. Maria Cekanova, Seong Ho Lee, Mugdha Sukthankar, Jason Liggett, Nichelle Whitlock, and C. K. Choi. Not pictured Cheryl Li.



ruption of the cell cycle by phytochemicals. It has also been suggested that phytochemicals may work via anti-oxidative activity, inhibition of enzymes (such as cyclooxygenase and lipoxygenase) related to tumor promotion, inhibition of activator protein-1, angiogenesis, vascular endothelial growth factor, and others. Thus, phytochemicals could influence many pathways, but obvious mechanisms by which each phytochemical induces cell death or anti-tumor effects remain to be determined.

NAG-1 as a target protein for chemopreventive compounds

NAG-1 (NSAID-activated gene-1) was identified in COX-negative cells as a divergent member of the TGF- β superfamily. In order to clarify the biological function of NAG-1 in vivo, we have generated special transgenic mice (NAG-Tg) which, when crossed with Protamine-Cre mice, over-express NAG-1 in all tissues. Anti-tumor activity in NAG-1-Protamine-Cre NAG-Tg mice has been evaluated in studies of azoxymethane (AOM). Azoxymethane is a colon carcinogen that is used to study the development of sporadic colorectal cancer. The NAG-1 mice showed smaller numbers of aberrant crypt foci (precursors of colon cancer) in their colon, compared to the wild type mice, suggesting that NAG-1 may have anti-tumor activity and/or chemopreventive activity. NAG-Tg mice were also mated with Min mice, which spontaneously develop intestinal polyps due to a mutation in the APC gene. *Apc*^{Min/+}/*NAG*^{+/-} showed an impressive 58 percent reduction in small intestine polyp numbers and a 60 percent reduction of tumor load (1). Thus, expression of human NAG-1 inhibits the development of chemically and genetically induced abnormal cell growth in the intestinal tract.

All these data strongly support the inhibitory role of NAG-1 in tumorigenesis and suggest it functions as a tumor suppressor gene in vivo. NAG-1 in human colorectal cancer cells is activated by several NSAIDs, as well as by anti-tumor phytochemicals, including resveratrol, genistein, diallyl disulfide, indole-3-carbinol, and PPAR γ ligands. This suggests that NAG-1 plays a pivotal role in the chemopreventive action of several compounds including NSAIDs, PPAR γ ligands, and phytochemicals.

Summary

Cancer prevention by the use of NSAIDs, PPAR γ ligands, and phytochemicals appears to be dependent on a complex series of biological events, many of which are poorly understood. The critical role of the p53 tumor suppressor protein involved in cancer cell death is clearly supported by a large body of evidence, and thus, induction of p53 protein is the most apparent mechanism for cancer prevention. Changes in gene expression mediated by anti-tumor compounds likely play an important role in both cancer development and cancer prevention.

Our understanding of how these compounds prevent cancer is made more complex by the many signaling pathways reported in the literature. We have found that the gene NAG-1 responds to many chemopreventive compounds (Fig. 1). Investigations of the regulation of NAG-1 expression have revealed complex mechanisms that can be modulated by a number of drugs and chemicals. Noteworthy is the finding that the tumor suppressor pathways activate NAG-1 expression. Likewise, inhibition of the tumor promoting signaling pathway increases NAG-1 expression.

These findings link NAG-1 as a potentially important downstream target in tumor suppression. Recently, we also found that NAG-1 may have an

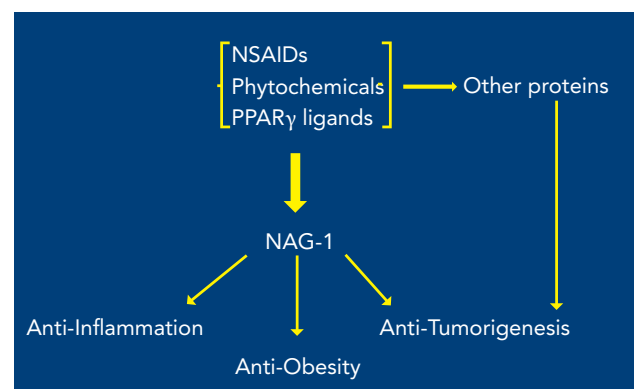


Fig. 1. Schematic diagram of NAG-1 activation by several chemopreventive compounds.

anti-inflammatory and anti-obesity function. How NAG-1 expression affects inflammation and obesity will be discussed in the near future.

Our recent work with transgenic mice has helped refine our understanding of the tumor suppression role of the NAG-1 gene in genetically and environmentally induced colon cancer. While early detection is currently key to increasing survival rates among humans, preventive strategies available from common anti-inflammatory and anti-diabetic drugs, combined with dietary choices, may one day lead to a reduction in the occurrence of this deadly form of cancer.

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Securing the Nation's Agricultural and Food Sectors

The Center for Agriculture and Food Security and Preparedness (CAFSP), located in the University of Tennessee College of Veterinary Medicine, opened October 16, 2006. The Center has led several projects over the past year to support national efforts to protect America's agriculture and food supply.

Under the direction of Dr. Sharon Thompson, CAFSP has developed a 2½ day training course on agriculture and food vulnerability assessment for communities and industry. Funded by a competitive grant awarded by the Department of Homeland Security, the course is currently being delivered to communities across the nation at no cost. The course goal is to train individuals in the public and private sectors to assess vulnerabilities at a community and individual facility level in order to prevent and deter an act of agroterrorism. As of August 2007, the course is scheduled for delivery at 19 locations in 16 states.

Beginning with an assessment on a community-wide basis to determine the most critical facilities, the course then introduces participants to tools used for conducting a vulnerability assessment within an individual facility. The course presents a number of animal, crop, and food processing facility scenarios using video and other interactive techniques, and highlights the need to address the complexities of transportation as part of securing the agriculture and food sectors. The training ends with a half-day practical exercise in which participants conduct a vulnerability assessment and develop a mitigation strategy for a simulated facility. In June 2007, the Honor Society of Agriculture, Gamma Sigma Delta, at the University of Tennessee, awarded their Team Award of Merit for the second year in a row to the project development team for this course. More information on the course can be found on the Center's Web site at <http://www.vet.utk.edu/cafsp>.

CAFSP has also provided information on its activities to protect America's critical infrastructure at the FBI International Symposium on Agroterrorism, the Plum Island Animal Disease Center, the National Beef Cattleman's Association, and the Alabama Agricultural Security Conference. In February 2007, CAFSP presented a program "Protecting the Homeland" at the National Association of State Universities and Land-Grant Colleges in Washington, D.C.

In May 2007, the Center co-hosted with the U.S. Department of Agriculture a week-long training course on "Foreign Animal and Emerging Diseases" in Knoxville.



The 2007 Gamma Sigma Delta Institute of Agriculture Team Award of Merit was presented to the Agriculture and Food Vulnerability Assessment Program Project Team. Members of the award-winning team are: Linda Beets, Dr. Tim Cross, Dr. Ann Draughon, Babbet Harbison, Dr. Fred Hopkins, Dr. Nancy Howell, Dr. John Jared, Aaron Killian, Dr. Robert Linnabary, Tina McConnell, Dr. John New, Jr., Dr. Michael Sims, David Smelser, Phillip Snow, Dr. Sharon Thompson, Dr. Matthew Welborn, and Ann White.

Experts from around the world spoke on topics such as avian influenza, foot and mouth disease, and other diseases of national and international concern. Most of these are not currently found in the United States, but if accidentally or intentionally introduced, could have debilitating effects on the nation's economy, public health, and confidence in its food supply. By training individuals to recognize and respond to such diseases, the impact an outbreak might have on the nation could be minimized.

CAFSP has also delivered several training programs with funding support from the Tennessee District 2 Homeland Security Council. "Agroterrorism and Biosecurity" focused on the potential impacts of agroterrorism and agents of concern for an attack against the food supply or animal agriculture. "Integrated Response in an Agricultural Disaster" covered local, state, and federal roles in an agricultural disaster. A third program addressed response issues in an animal disaster and animal handling and biosecurity provisions for responders and producers. The Center's animal handling video will be provided to workers credentialed in District 2 to provide support for an animal disaster.

The Center has recently added two associate directors to assist in the expansion of its activities: Drs. Matthew Welborn and Leon Potgieter, former Associate Dean of Hospital Operations. These two new members will prove vital to support efforts to protect America's agriculture and food supply. **V**

Veterinary Faculty and Staff

New Employees, Awards, Promotions, Appointments, and Retirements

Dr. Xuemin Xu, Professor of Pathobiology, was recognized with a 2007 UTK Chancellor's Award for Research and Creative Achievement. Dr. Xu's research in Alzheimer's disease has fundamentally challenged the accepted dogma surrounding Alzheimer's disease and may lead to specific targets for treatment and prevention of this debilitating disease. His research focuses in on molecular mechanisms of intracellular signaling, and he recently received a new NIH grant in support of his work.



Dr. Xuemin Xu

A 2007 Chancellor's Award for Excellence in Teaching was presented to CVM's **Dr. Dianne Mawby**, Clinical Associate Professor (Small Animal Clinical Sciences), who was cited for 'combining consistent enthusiasm and energy in her teaching.' Her philosophy is that learning must combine fun, stimulation, and satisfaction. Mawby was voted Clinician of the Year by senior students, only two years after her arrival at UTCVM.

The University of Tennessee 2007 Macebearer is **Dr. Al Legendre**, Professor of Medicine and founding faculty member in the College of Veterinary Medicine, in recognition of his combination of exemplary teaching, research, and service to the university community for the past 32 years. The Macebearer is the highest faculty honor at The University of Tennessee, symbolic of



Dr. Alfred M. Legendre with UTK Chancellor Loren Crabtree

the faculty's commitment to service to students, to scholarship and to society. Dr. Legendre was the college's director of medical services from 1975 through 2000. In 2006 he was honored with the Mark L. Morris Lifetime Achievement Award, the most prestigious award presented by the American Veterinary Medical Association, in recognition of a veterinarian who has made a lifetime commitment to improving the health of companion animals through research and education.

UTCVM's **Dr. Melissa Kennedy** ('83), Assistant Professor received the 2007 Chancellor's Award for Excellence in Teaching. A member of the Comparative Medicine faculty, she is director of the virology laboratory. Her research focuses on viral diseases of



Dr. Melissa Kennedy

nondomesticated animals, and she frequently travels to Africa for field research purposes, taking students with her. Her ongoing research project "Detection of Coronavirus Shedding in Captive and Wild-caught Cheetahs in Southern Africa Using Real-Time PCR" recently received a travel grant from the Morris Animal Foundation.

A UT National Alumni Association Outstanding Teacher Award was presented to CVM's **Dr. Joseph Bartges**, Professor of Medicine and Nutrition. Bartges holds the Acree Family Chair in Small Animal Research. His teaching philosophy is to stimulate students to be inquisitive and to develop a passion for veterinary medicine.



Dr. Joseph Bartges

Dr. Frank Andrews, Professor (Large Animal Clinical Sciences), received a commemorative plaque from the Board of Directors of the Comparative Gastroenterology Society in recognition of his six years of distinguished service.

2007 Dr. Dennis Coughlin Professors included **Dr. John New**, Professor and Department Head, Comparative Medicine, who also gave the general session address at the UTCVM Annual Conference.

Assistant Dean for Organizational Development and Outreach, **Dr. Dennis Geiser**, has been appointed to the Tennessee Center for Performance Excellence (TNCPE) 2007 board of Examiners. Every year, the TNCPE award program recognizes education, healthcare, business, and non-profit organizations demonstrating excellence in business operations and results. The Board of

Examiners is composed of experts from all sectors, including business, industry, education and health care organizations, professional and trade associations and government. Those selected meet the highest standards of achievement and peer recognition in their fields. All members of the board must complete extensive training in the Baldrige National Quality Program Criteria for Performance Excellence. Established in 1993, TNCEP promotes economic development by helping companies grow more competitive in today's global marketplace.

Dr. Robert DeNovo assumed the role of Associate Dean for Administration and Clinical Programs on August 1, 2007. The position replaces that of Associate Dean for Hospital Operations previously held and effectively administered by **Dr. Leon Potgieter**, who has returned to the Department of Comparative Medicine faculty. Potgieter, who is an internationally recognized expert in foreign animal diseases, will also serve as Associate Director in the Center for Agriculture and Food Safety and Preparedness. (see page 12)

Dr. Claudia Kirk, DVM, PhD, Associate Professor of Medicine and Nutrition, has assumed the role of Acting Head of the Department of Small Animal Clinical Sciences.

Dr. Tomas Martin-Jimenez, Assistant Professor of Pharmacology (Comparative Medicine), received a grant from the Faculty First 2007 Program through UT's Innovative Technology Center (TIC) to develop an interactive web-based mastery learning system for Veterinary Pharmacology I, a course required during the second year of the veterinary curriculum.

The International Equine Veterinarians Hall of Fame saluted six new members at the 2007 International Hoof-Care Summit including UTCVM's **Dr. Dallas Goble**, former director of equine clinics, who retired in 2004. Dr. Goble, who earned a reputation

as one of the leading international authorities on medical and surgical matters related to the draft horse, remains active with the Budweiser Clydesdale Health Program and continuing education programs, and



Dr. Dallas Goble

he continues to consult on a variety of equine lameness issues.

Dr. Matthew Welborn recently completed a Weapons of Mass Destruction course at the Center for Domestic Preparedness (CDP) in relation to his work with UTCVM's Center for Agriculture and Food Security and Preparedness. Dr. Welborn recently transferred from UTCVM's Large Animal Sciences department to the department of Comparative Medicine. (see page 12)

Dr. Patricia Coan has joined UTCVM as Director of the Office of Laboratory Animal Care and Clinical Associate Professor in the department of Comparative Medicine. Dr. Coan came to UTCVM from Tulane

University. She holds the DVM from Auburn, the PhD from the University of Alabama at Birmingham and is a Diplomate of the American College of Laboratory Animal Medicine (ACLAM)



Dr. Patricia Coan

Dr. Frederica Morandi, DVM, MS, Dipl. ACVR and ECVR, Associate Professor, has assumed the position of Director and section head of Radiology.

Dr. Karen Kalck received a large animal resident award from the American College of Veterinary Internal Medicine (ACVIM) with recognition for her platform presentation entitled, "Glucose Dynamics During the Development Phase of Oligofructose-induced Laminitis in Horses."

Dr. Marti Drum, DVM, PhD, joined the Small Animal Clinical Sciences small animal rehabilitation team as a clinical instructor, joining veterinary



The 2007 Tennessee Veterinary Medical Association's (TVMA) Lifetime Achievement Award was presented to UTCVM's **Dr. John Henton**. Henton, Professor of Theriogenology, ably serves the college in multiple roles as Coordinator of Continuing Education, Outreach, and Alumni Activities, including the planning and promotion of the UTCVM Annual Conference and UTCVM alumni reunions for over fifteen years.

technicians Bobbi Werbe and Carol Tuft. Dr. Drum comes to UTCVM from Colorado State U. where she completed both advanced degrees.



Dr. Marti Drum

Dr. Sharon Patton, Professor, Parasitology (Comparative Medicine) marks her 31st year of teaching at UTCVM in 2007. In July, Patton co-chaired the Education Symposium of the American Association Veterinary Parasitologists (AAVP).

Dr. Joanne Smith, Vet MB, PhD, recently completed her internal medicine residency at UTCVM and will continue on as a clinical instructor on a one-year appointment.



Dr. Joanne Smith

Dr. Patricia Sura, DVM, MS, is Assistant Professor of Surgery in Small Animal Clinical Sciences following her residency here. Dr. Sura won the Resident's Clinical Research Competition at the American College of Veterinary Surgeons Symposium in the fall of 2006.

Assistant Professor of Anatomic Pathology, **Dr. Kim Newkirk**, joined the Pathobiology faculty in 2007. Dr. Newkirk recently completed a combined residency/PhD program at The Ohio State University. Newkirk



Dr. Kim Newkirk

received the DVM from Virginia Tech. and is a Diplomate of the American College of Veterinary Pathologists (ACVP).

APEX 2007 Awards of Excellence have been presented to CVM's **Misty Bailey**, technical writer, and **Anik Vasington**, graphic designer, in the One-to-two person-produced annual report for their work on the annual report for the Center of Excellence in Livestock Diseases and Human Health [www.vet.utk.edu/coe/pdf/AnnRpt2006.pdf] **Misty Bailey** also received an Award of Excellence in the New Newsletters category for her work on Discovery, the quarterly research newsletter for the college [www.vet.utk.edu/research/newsletters/06/Dec_2006.pdf]



Misty Bailey



Anik Vasington

Dr. Terry Stevens has joined the veterinary teaching hospital as the new Pharmacist.



Dr. Terry Stevens

Dr. Jackie Whittemore, DVM, DACVIM, has accepted the Assistant Professor in Internal Medicine position in Small Animal Clinical Sciences. She is completing the PhD at Colorado State University.

Dr. David Rotstein, DVM, PhD, DACVP, Clinical Assistant Professor, Pathobiology recently had his contract with the National Oceanic and Atmospheric Administration NOAA renewed for an additional two years.

The following UTCVM employees were recognized for 15 years of service:

Christine Weaver (Large Animal Clinical Sciences)

Faculty Promotions and Tenure

Large Animal Clinical Sciences

Dr. Thomas Doherty – Professor (Anesthesiology)

Pathobiology

Dr. Xuemin Xu – Professor

Comparative Medicine

Dr. Melissa Kennedy – Associate Professor with tenure

Small Animal Clinical Sciences

Dr. Federica Morandi – Associate Professor with tenure and newly appointed Director and Section Head of Radiological Services.

Dr. Jennifer Stokes – Clinical Associate Professor

Staff Promotions

Small Animal Clinical Sciences:

Lindsay Scanson – to Vet. Tech II

Leslie Wereszczak – to Senior Vet. Tech II

Kelly Jacobs – to Vet. Tech II

New Staffers

UTCVM Administration.

Dean's Office:

Sandra H. Hill, Administrative Specialist II.

Partnership Programs:

Tina McConnell, Accounting Specialist III
Teri K. Tibbs, Administrative Support Assistant III
Dorothy Dove-Murphy, Administrative Support Assistant III

Development:

Reanee Boozer, Advancement Assistant III

IT:

Dustin D. Hurt, IT Specialist I.

Large Animal Clinical Sciences

Chris Carter, Technician Coordinator
Dawnya Breeding, Night Vet. Tech.
Allison Dylewski, Veterinary Assistant
Amber Burnett, Veterinary Assistant
Monica Baxter, Veterinary Assistant
M. Catherine Marsh, Veterinary Assistant
Michelle Sineath, Research Tech

Comparative Medicine

Denise A. Gaylord, Veterinarian
Derek Slagle, Laboratory Technologist II – Endocrinology

Pathobiology

Larkesha Y. Coffee, Accounting Assistant III
James H. Dale, Clinical Supervisor I
Gabriella M. Dalton, Lab. Assistant I
Deborah M. Hill, Admin. Support Assistant I
Li, Xiaoou, Research Associate I
Tracy L. Russell, Accounting Assistant III
Nancy Hutto, p-t in Histology Lab. (Anatomic Path).

Small Animal Clinical Sciences

Dr. Effie Kelmer, Clinical Assistant Professor, ECC.
Gerald W. Buker II, Vet. Tech. I
Hannah L. Byrd, Research Specialist I
Katherine A. Clark, Vet. Tech. I
Amy Grace Parker, Instructor
Elaine S. Stanby, Vet. Tech.
Melissa A. Wilson, Vet. Assistant
Jennifer L. Wysocki, Vet. Tech. I
Bradley J. Walker, Vet. Assistant

Veterinary Hospital:

Marsha E. Hayes, Patient Rep.
Catalina J. Hoffman, Sr. Med. Records Clerk
Nicholas J. LeTellier, Sr. Med. Records Clerk
Patricia A. Moore, Sr. Med. Records Clerk
Jerri A. Tabor, Patient Rep.

Animal Resource Laboratory:

Dr. Joleen K. Adams, Veterinarian

Laboratory Animal Care:

Jason D. Porter, Clinical Asst. II

RETIREMENTS

Dr. Geneva Brown, Veterinary Social Work
Bruce McNeil, Pharmacist



Teams representing all units of the college display their teamwork skills at the annual UTCVM faculty/staff retreat held recently at the Ijams Nature Center in Knoxville.



Grants and Contracts

July 2006 - June 2007

PI; CO-PI	DEPARTMENT	AWARD	AGENCY
Charles Faulkner	Comparative Medicine	3,465	Discover Life in America
George Cain	Comparative Medicine	2,400	Magna Flow
Agricola Odoi	Comparative Medicine	25,000	Univ of KY Research Foundation
John New	Comparative Medicine	21,330	Winn Feline Foundation & George Sydney and Phyllis Redmond Miller Trust
Kellie Fecteau	Comparative Medicine	10,908	AKC Canine Health Foundation
Melissa Kennedy	Comparative Medicine	4,000	Morris Animal Foundation
Melissa Kennedy	Comparative Medicine	14,750	WINN Feline Foundation
Stephen Kania	Comparative Medicine	22,206	UT-Battelle ORNL
Thomas Martin-Jimenez	Comparative Medicine	35,500	Pfizer, Inc.
Michael Sims	Instructional Resources	13,340	Kenneth A. Scott Charitable Trust
Frank Andrews	Large Animal Clinical Sciences	10,725	Seabuck Equine LLC
Frank Andrews	Large Animal Clinical Sciences	46,015	SmartPill Corporation
Nicholas Frank	Large Animal Clinical Sciences	15,000	ACVIM
Nicholas Frank	Large Animal Clinical Sciences	26,638	Grayson Jockey Club Research Fdn
Nicholas Frank	Large Animal Clinical Sciences	26,638	Lloyd, Incorporated
Nicholas Frank	Large Animal Clinical Sciences	77,945	SmartPak Equine
Nicholas Frank	Large Animal Clinical Sciences	15,000	Waltham Foundation
Sarel Van Amstel	Large Animal Clinical Sciences	13,260	Merial Limited LLC
Steve Adair	Large Animal Clinical Sciences	28,916	Cook Biotech Incorporated
Steve Adair	Large Animal Clinical Sciences	13,129	Private Industry
Barry Rouse	Pathobiology	287,228	National Institutes of Health
Barry Rouse	Pathobiology	347,575	National Institutes of Health
Casey LeBlanc	Pathobiology	12,906	AKC Canine Health Foundation
David Rotstein	Pathobiology	103,062	Nat'l Oceanic & Atmospheric Admin
David Rotstein	Pathobiology	15,600	Nat'l Oceanic & Atmospheric Admin
Hildegard Schuller	Pathobiology	31,406	National Institutes of Health
Howard Plummer	Pathobiology	262,796	Philip Morris
Mei-Zhen Cui	Pathobiology	240,270	National Institutes of Health
Mei-Zhen Cui	Pathobiology	184,200	Philip Morris
Michael McEntee	Pathobiology	30,060	Cornell University
Seung Joon Baek	Pathobiology	162,000	American Cancer Society
Seung Joon Baek	Pathobiology	405,829	National Institutes of Health
Xuemin Zu	Pathobiology	297,250	National Institutes of Health
Xuemin Zu	Pathobiology	80,000	Alzheimer's Association
Amy LeBlanc	Small Animal Clinical Sciences	25,000	National Cancer Institute
Angela Lusby, Claudia Kirk	Small Animal Clinical Sciences	5,938	Nestle Purina PetCare
Beth Johnson	Small Animal Clinical Sciences	12,960	AKC Canine Health Foundation
Cheryl Greenacre	Small Animal Clinical Sciences	22,027	Morris Animal Foundation
Claudia Kirk	Small Animal Clinical Sciences	34,969	Hills Pet Nutrition
Claudia Kirk	Small Animal Clinical Sciences	27,099	Morris Animal Foundation
Claudia Kirk	Small Animal Clinical Sciences	14,952	Waltham Foundation
Darryl Millis	Small Animal Clinical Sciences	9,900	Novartis
Joe Bartges	Small Animal Clinical Sciences	45,000	Fort Dodge Animal health
Joe Bartges	Small Animal Clinical Sciences	27,950	Lloyd, Incorporated
Joe Bartges	Small Animal Clinical Sciences	4,000	Morris Animal Foundation
Joe Bartges	Small Animal Clinical Sciences	18,974	Morris Animal Foundation
Joe Bartges	Small Animal Clinical Sciences	52,091	Nestle Purina PetCare
Karen Tobias	Small Animal Clinical Sciences	7,105	DeRoyal Industries, Incorporated
Ralph Harvey	Small Animal Clinical Sciences	12,500	Abbott Laboratories
Robert Moore	UTCVM Research Administration	526,300	State of TN - Centers of Excellence
	TOTAL:	3,733,112	

American Association of Zoo Veterinarians (AAZV) 2007 Conference

UTCVM and Knoxville Zoological Gardens to co-host annual conference, October 20-26, 2007

The AAZV works to advance the field of veterinary medicine dealing with captive and free-ranging wild animals. The international meeting will draw some 500+ zoo veterinarians and veterinary students from the United States and more than twenty countries, including developing countries. Invertebrate medicine, endoscopy, and zoo animal dentistry are among the wet labs that will be offered.

Participants will gather in Knoxville for the week-long conference that was first brought to town in 1978 by the late Dean Hiram Kitchen. UTCVM is fortunate to have a close collaboration with the Knoxville zoo, and hosting the meeting in East Tennessee provides the opportunity to showcase not only our programs, but also the relationship with the zoo to the international zoo community. While numerous veterinary colleges offer experience in exotic pet medicine, only about a half dozen in the country place an emphasis on zoo medicine as an integral part of the curriculum. Hosting the AAZV conference draws attention for one week in October, but the college's avian and zoological medicine section draws international attention throughout the year as students come to the college from around the world for externships. ■



Dr. Ed Ramsay and cheetah patient

2001 UTCVM alumna Dr. Haley Adams received the Graduate Student Award from the American College of Microbiology at the Conference of Research Workers in Animal Disease (CRWAD),



Dr. Haley Adams with lion cub

an international meeting. Adams is a PhD student in Comparative and Experimental Medicine, an intercollegiate program of UTCVM and UT Graduate School of Medicine. Dr. Adams' project is the study of lentiviruses in southern African lions, and she spent six months in South Africa working on the PhD project in collaboration with the University of Pretoria. The purpose of CRWAD is to discuss and disseminate the most current research advances in animal diseases. ■

First place in the 2007 Hill's Pet Nutrition, Inc. Innovations in Public Health Award writing competition went to **Tinsley Youmans**, CVM '09, for her entry entitled, "Improving the quality of life for pet-owning Meals on Wheels recipients with flea and tick prevention."

Melissa Mustillo, CVM '09 received a 2007 Morris Animal Foundation Veterinary Student Scholarship for a summer project under the mentorship of Dr. Joe Bartges, Acree Family Chair in Small Animal Research. Melissa is working to evaluate the effect of a high protein/low carbohydrate diet on risk for urinary stone formation in cats.

Lisa Marie Grupka, CVM '07 received Top Collegiate Scholars recognition at the 2007 UTK Chancellor's Honors Banquet. **Tamera Lynn Lechner** CVM '07 and **Kristin Devere Miller**, CVM '07 were recognized for Extraordinary Professional Promise by UTK Chancellor Loren Crabtree at this year's Chancellor's Honors Banquet. ■

Educational Enhancement Updates

Leaders in Training

It's no secret that students of veterinary medicine are bright, motivated, and energetic...some might even say driven. Young graduates entering veterinary practice, however, may not have mastered the necessary life and leadership skills to cope with the demands of a challenging profession.

To ensure that young professionals are just as savvy in life skills as in technical skills, each summer the American Veterinary Medical Association offers an intensive leadership and professional development program for veterinary students and faculty. UTCVM now has seven "graduates" of the Veterinary Leadership Experience program. Thomas Slattery and Deborah Spector (Class of 2008), Meredith McCoy and Allison Dylewski (Class of 2009), Paul Nolen and Ashley Portmann (Class of 2010), and Dr. Amy Plummer (Large Animal Clinical Sciences) have attended the week-long program held at Ross Point Camp and Conference Center, a rural retreat in northern Idaho.

Participants work through intensive self-awareness, team-building, communication, and leadership training exercises and return to their campuses with new skills and perspectives.



UTCVM students Meredith McCoy, Ashley Portmann and Paul Nolen (L-R) prepare to take to the water during the 2007 Veterinary Leadership Experience.

Back in Knoxville, this year's class is already implementing many innovative ideas: leading a team-building night for new house officers, developing new orientation plans for incoming students, and planning other professional development activities for the veterinary curriculum. These student leaders have embraced the concept of veterinarians as leaders in the community and in society. They embody the spirit of the veterinarian of the future.

These activities and others are partially supported by the UTCVM's Educational Enhancement Fund. ■

Application Based Learning Exercises (ABLE)

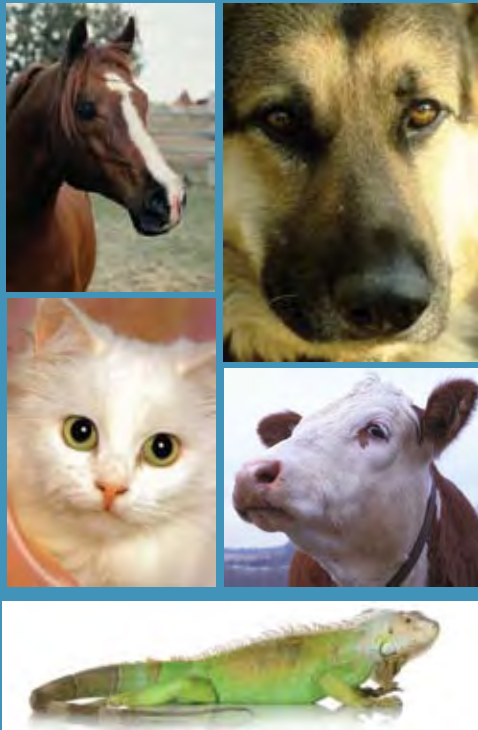
In addition to required core courses focusing on public health, the college has incorporated public health topics into its problem-based learning program. Application Based Learning Exercises (ABLE), are medical cases presented by progressive disclosure for intensive problem solving, self-directed learning and discovery.

Each ABLE case lasts one week, with all other DVM curriculum courses suspended for that week, allowing students to focus on the ABLE case. Students in small groups of seven work with a facilitator to engage in problem-solving exercises during ABLEs, provided in the first three (pre-clinical) years. In addition to the medical subject matter presented in ABLEs, topics related to public health, economic issues, ethics, as well as client education and communication issues stimulate student discussion and learning.

DVM students gain exposure to public health or population medicine in three of the six cases. In-

depth study of animal diseases and conditions with potential impact to human health provide a learning experience for veterinary students that relate to societal implications as well as biomedical and scientific learning objectives. ABLE cases include an exotic bird housed in a private nursing home with clinical signs of a zoonotic disease, a dairy herd disease that impacts food supply, and a foreign animal disease outbreak at a rural farm. Regulatory medicine and public education are also emphasized in the ABLE. Students have an opportunity during one ABLE to explain a potential disease outbreak to the lay public through simulated media interviews.

These learning techniques help put future veterinarians in a scenario typically outside of their current medical expertise and comfort level, that of a public health professional. By providing such exposure to veterinary students, they also develop a better appreciation for their public health role in veterinary medicine. ■



Coming Soon

(September 30, 2007)

to the UTCVM WEB SITE
www.vet.utk.edu/giving/

Annual Donor Honor Roll of Giving

July 1, 2006 – June 30, 2007

THANK YOU

for your support of the
College of Veterinary Medicine!

LAST CHANCE – TAX INCENTIVE FOR IRA GIFTS in 2007



Mandatory minimum withdrawals from Individual Retirement Accounts (IRAs) often provide people with income they don't really need while at the same time increasing income tax taxes and possibly reducing social security benefits. If that describes your situation you may want

to consider taking advantage of a special tax incentive for IRA gifts provided in the 2006 Pension Act. Until the end of 2007, you may donate up to \$100,000 from your IRA to the College of Veterinary Medicine and totally avoid income tax on the distribution.

By enacting the Pension Act of 2006, Congress sought to encourage people over 70 ½ to make gifts using their IRAs. To that end the Act provided the opportunity for individuals in this group to make gifts during 2006 and 2007. The tax advantage provided in the law is that IRA owners can make gifts at less cost to them due to the avoidance of income taxes. In addition, they can increase their gifts by 17 to 53 percent for the same reason. The law provided that people age 70 ½ and older can instruct their IRA

trustee to make transfers directly to the organization they want to support without incurring taxable income on those amounts. Up to \$100,000 can be given this way. Income tax deductions cannot be taken for the IRA gifts, but the donors still realize significant tax savings, which will allow the size of the gift to be increased without a cost increase due to taxes.

When IRA distributions are taken they are heavily taxed at rates as high as 35 percent. That tax burden continues to your heirs when they receive IRA funds from your estate. You may take advantage of this tax incentive until the end of 2007. For example, if you normally make a gift of \$10,000, by taking advantage of this incentive you can make a \$13,888 gift at no real additional cost to you if you are in the 28 percent tax bracket.



To recap, donors must be past the age of 70 ½ and they may contribute up to \$100,000 from their IRA. Other retirement plans such as the 401(K) are not eligible. The gift must be transferred directly from the IRA trustee to the University. For more information on this and other tax-wise giving opportunities you may contact Dennis Jones at (865) 974-7423 or at djones@utk.edu. Always consult your tax adviser concerning these matters to determine if this opportunity is right for you. ■

Veterinary Social Work in the Service of Public Health

Until he extends his circle of compassion to include all living things, man will not himself find peace.
Albert Schweitzer, French philosopher & physician (1875 - 1965)

The Human Touch

People often ask, "Veterinary social work? What is that? Do you give psychotherapy to pets?" As vet social workers, our gentle yet persistent answer is... "No, that is what animal behaviorists do...Vet social workers take care of the human side of things."

This "human side of things" is where vet social work promotes the public health mission of veterinary medicine. Veterinary social workers practice at the intersection of veterinary medicine and social work, helping with the human needs that arise in the course of veterinary practice. Because promoting public health is part of the oath veterinarians take when they enter the profession, and because public health has a very broad mission, veterinarians work with allied professionals to meet the responsibility of their oath. Social workers are one of the allied professionals that can help.

Four important areas where vet social workers can intervene are a) helping owners and families who are grieving over ill or deceased animals, b) utilizing animal-assisted activities as therapeutic interventions for a wide range of client populations, c) assisting with the grief, trauma, and stress that animal-related professionals encounter in their work, and d) intervening in situations where there is a link between human and animal violence.

Violence is one of the most pronounced public health problems in America; paying attention to the link between human and animal violence is therefore paramount. Veterinarians may be the first to encounter a case of family violence if an animal is presented in the veterinary medical clinic with suspected "Non-Accidental Injury" (NAI). Confronting an owner who may be experiencing family violence about this possibility can be difficult because denial is one of the first reactions many family members display in these situations. The presence of a veterinary social worker with the communication skills and resources necessary to aid in this situation can be extremely helpful to a veterinarian in upholding the professional oath.

Legislative Progress on Animal Abuse and Family Violence

Research suggests that if a woman subjected to family violence fears for her animal's safety, she may remain in the abusive situation. Until quite recently, Tennessee state laws had not addressed situations involving animals in cases of family violence. Without explicit language in the laws, a woman in such cases could be forced to leave her animal with her abuser.

This summer, the Tennessee legislature signed into law Public Chapter 0352 which provides victims a legal means of protecting their animals. This legislation, which went into effect July 1, 2007, clarifies that threats and harm to pets constitute abuse. Furthermore, it allows animals to be covered under Orders of Protection and prevents batterers from keeping pets that belong to their victims.

Helping spearhead this legislative effort was Bethanie Poe, Veterinary Social Work's (VSW) 2006-2007 Management and Community Practice Intern. Bethanie collaborated in helping provide educational materials to lobbyists promoting this bill, developed a brochure that outlined the link between family violence and animal cruelty, and e-mailed a brochure outlining the link between human/animal violence to more than 320 family violence and animal welfare organizations across the state. To encourage people to contact their legislators, in the body of the e-mail Bethanie provided information about the proposed legislation and contact information for legislators involved in the corresponding committees.

Bethanie also contacted the Tennessee chapter of the National Association of Social Workers (NASW) and provided information about the bill to their lobbyist. In addition, she spoke to state legislators about the bill, distributing the brochures about the link between family violence and animal cruelty and a fact sheet about the bill.

Thanks to Bethanie's efforts, two lobbyists not previously aware of the bill began lobbying for it. The Tennessee Chapter of NASW also began tracking the

bill and requested electronic copies of the brochure and the handout to link them to the NASW-TN website. Bethanie was even invited to testify before the Senate Judiciary Committee. In addition, a cocker spaniel rescue worker posted the information on her "blog" along with her personal stories about calls from family violence victims trying to find safe spaces for their pets

This law could potentially help thousands of victims of family violence, a significant public health issue. Consider that in Tennessee in 2001, there were more 60,000 reported incidents of family violence, and half of Tennessee residents own pets. Furthermore, in the one county where the court does issue Orders of Protection that include animals, 25 percent of orders of protection requested that their animals be included.

Training in Veterinary Social Work— A Collaborative Effort

Each year Veterinary Social Work trains master's and Ph.D. level social work students who are enrolled in the College of Social Work. Because of the wonderful alliances between UTCVM programs Companion Animal Initiative in Tennessee and the Human Animal Bond in Tennessee (see pp. 23 and 26), as well as the Veterinary Teaching Hospital, the social work students can get extensive training in the four areas of veterinary social work.

Bethanie Poe's work is a perfect example of the ways these programs intersect. Bethanie's efforts came about through her volunteer membership on the CAIT legislative committee, as well as coursework in College of Social Work's second-year social work curriculum, and of course her VSW internship. Additionally, another recent social work graduate, Erin Allen, MSSW, completed her clinical internship with VSW and enrolled her basset hound, Samantha, in the HABILIT program for animal assisted activities. Erin has subsequently been offered and taken a job at the prestigious Argus Institute in Colorado, one of the oldest programs providing pet loss care in the country.

Mark Your Calendars

In April 2008, UTCVM will host the first ever Veterinary Social Work Summit. This will be an opportunity for national and international professionals working in this field to come together and discuss the best practices and future goals of this new area of human/animal related work. ■

For further information, or if you would like to contribute in any way to Veterinary Social Work, please contact Founding Director, Dr. Elizabeth Strand, LCSW at 865-974-8387. To give go to www.vet.utk.edu/giving/

The Summer Experience of a Lifetime

The Veterinary Summer Experience is an eight-week program that provides high school students an opportunity to gain experience at a veterinary practice in their home town with a sponsoring community veterinarian for seven weeks during the summer. Then, during the last week of the program, the students visit UTCVM to explore the depths of veterinary medicine.

The program provides opportunities for students interested in veterinary medicine while simultaneously generating a pool of potential veterinary students for the future. Dr. William Hill, Director of Diversity at the college, says the program is designed to offer valuable educational experiences. "We want to acquaint these high school students with all facets of veterinary medicine and make that opportunity available to a diverse population. Previously, the Veterinary Summer Experience was open only to African-American high school students, but this year we broadened our applicant pool and recruited from various ethnic, cultural, and social backgrounds," said Hill. Preference was given to applicants who would contribute greatly to the diversity of the program and potentially the veterinary profession.

Eight high school students from across Tennessee experience what life is like for veterinary students. Students were paid for the eight-week program, and a grant from the Tennessee Higher Education Commission helps fund the Veterinary Summer Experience, which began in 1993 under the leadership of Dr. Nancy Howell. ■



Improving the lives of companion animals in Tennessee

It is estimated that more than 4 million cats and dogs, including puppies and kittens, are euthanized in animal shelters across the United States every year. In 2006, more than 70 percent of all cats and dogs that entered shelters, animal control facilities, and humane societies in Tennessee were euthanized. The most common reason is simple: the supply is much larger than the demand.

CAIT is determined to help reduce the high number of unwanted cats and dogs in Tennessee. Our volunteers are working hard to make that happen.

In early 2007, the CAIT Sterilization Committee conducted a survey of 43 animal control facilities, animal shelters, humane societies, and spay-neuter clinics in Tennessee. Participants in the Tennessee Animal Agencies Survey included 16 agencies in the eastern, 13 in the middle, and 12 in the western region.

Of the 99,124 cats and dogs taken in by the respondents, only 3 percent were ever reclaimed by their owners, 25 percent were adopted into homes, and 72 percent were euthanized.

These figures underscore the importance of CAIT's community efforts to reduce the number of pets entering shelters in the first place. In an effort to reduce the cat population, for example, CAIT has established Feral Fixin' events, where feral cats from the greater metropolitan Knoxville community are spayed or neutered and vaccinated against disease. CAIT has held seven Feral Fixin' events so far, altering 436 feral cats and preventing at least 249 births. These volunteer events bring together community-based animal organizations, private practitioners, faculty and staff from UTCVM, and our veterinary students. Students practice the procedures under faculty supervision and thereby gain skills and confidence that complement the curriculum.

An aggressive educational component is also now in place to educate citizens about the importance of keeping their cats indoors and never letting them out if they have not been spayed or neutered. In addition, a new brochure explains the public health and animal welfare problems that arise when people abandon cats.



All cats receive a thorough examination prior to spay/neuter surgery

In spring 2008, CAIT will add another spay-neuter component targeted at reducing the number of unwanted dogs. In partnership with Young-Williams Animal Center in Knoxville, Tennessee, CAIT will spay or neuter large breed dogs for low income citizens in the Animal Center's new mobile unit, the Spay Shuttle.

Many people believe a cat or dog must be of reproductive age to be spayed or neutered, but early age spay-neuter is now an option. In fact, healthy cats and dogs can be spayed or neutered as soon as they weigh just two pounds. At the Southern Region Spay Neuter Leadership Conference, held in Memphis in September 2007, CAIT is sponsoring the veterinary track. This includes a pediatric spay-neuter wet lab, which gives veterinarians from across the United States a chance to practice the procedures. Licensed veterinarians and licensed veterinary technicians can receive continuing education credits for their attendance. The wet lab will be repeated at

NEUTER

Feral Fixin' Days are a true community partnership involving volunteers from several local organizations and UTCVM concerned about feral cat community health.



UTCVM in spring 2008 to provide veterinary students the opportunity to gain hands-on experience in pediatric spay-neuter procedures.

Shelter medicine is emerging as a career option for veterinarians. To expose our UTCVM students to the area of shelter medicine and the problems facing shelter veterinarians in communities across the United States, in fall 2007, CAIT will sponsor guest speakers for UTCVM's first elective course in Shelter Medicine.

UTCVM faculty, staff, and students are also reaching out to the local community to assist low-income or disabled citizens who are unable to afford to have their pets spayed or neutered. Nestle Purina is contributing one free bag of Purina food each month to students during the academic year. Faculty, staff, and students may also purchase Purina cat and dog foods at a discounted rate every month. All the proceeds go into a special account that CAIT will use to sponsor spay-neuter learning activities for our students.



CAIT is also planning an event in honor of the 14th annual **Spay Day USA, which is February 26, 2008**. And to increase the impact of Tennessee's spay-neuter programs, CAIT is working hard to build relationships, assess the needs and resources for spay and neuter services, and explore practical and effective program improvements. To that end, CAIT held an all day Spay Neuter Workshop in 2007, with 53 participants from animal shelters, humane societies, rescue organizations, and the veterinary community who shared their ideas on improving the situation in Tennessee.

Educating citizens on responsible pet stewardship requires a cultural change, and that begins with youth. This school year, CAIT once again partnered with the Knoxville News-Sentinel to develop the K-2 curriculum portion of the Learning to

Spay and Neuter: Myths and Facts

- "Just one litter and we'll have her spayed." That attitude has led to the euthanasia of thousands of cats and dogs in Tennessee and countless more around the world. Choosing to have your pet spayed or neutered affects not just you but the community around you.
- "My cat or dog does not run loose." Pets that are not spayed or neutered are much more likely to try to escape and find a mate.
- "I'll find homes for all the puppies or kittens in the litter." Finding homes for pets means that fewer people will adopt cats and dogs from animal shelters, which may result in more sheltered animals being euthanized.
- "Spaying or neutering will make my pet fat and lazy." Too much food and not enough exercise will make your pet fat and lazy. It has nothing to do with having them spayed or neutered.
- "Spaying or neutering will alter my pet's personality." This is a fact. Your dog or cat will actually be more content to stay home, and neutered males are also less aggressive. Spaying and neutering not only prevents unwanted litters, it also eliminates many behavioral problems associated with the mating instinct. Female pets benefit from spaying because their heat cycles are eliminated. Negative behaviors associated with the heat cycle can lead to owner frustration and, ultimately, a decision to relinquish the pet to a shelter.
- Spaying or neutering your pet early will also prevent certain forms of cancer.

For more information call the Spay Neuter Helpline, (865) 974-6464. A recorded message lists spay neuter options for Knox and surrounding counties.



UTCVM students have the opportunity to work in partnership with community veterinarians during Feral Fixin' Days.

Save Lives Curriculum. Elementary school teachers can integrate this humane education curriculum into their daily activities and classrooms with ease.

To help provide teachers and humane educators across the state with valuable resources, the CAIT Education Committee sponsors the Speakers Bureau, which presents topics such as general health care for pets, senior pet care, pet selection, myths and facts about spaying and neutering, pet overpopulation, animal abuse, and coping with the loss of a pet. These 45-minute presentations—which are delivered in classrooms, to youth groups, and at other community meetings—are free of charge to interested groups or organizations in the Knoxville area.

New Laws for Animals in Tennessee

The CAIT Legislative Committee continues to partner with the UT College of Law on yearly updates to The Compiled and Edited Tennessee Laws Pertaining to Animals notebook. The notebook, which contains all the laws in Tennessee pertaining to animals, will have several new updates and additions for 2007. These provide important safeguards for the well-being of pets.

- An important resolution was passed recognizing the importance of spaying and neutering pets.

- A law was passed which establishes sexual conduct or sexual contact with an animal as a Class E felony offense.
- Animals are now included on orders of protection. A law, Public Chapter 0352, which expands the definition of domestic abuse to include physical harm, attempted physical harm, or threatened physical harm to a pet of an adult or minor was passed. • It is now an offense punishable by law for a person to knowingly tie, tether, or restrain a dog in a manner that results in bodily injury.
- The penalty for the offense of being present as a spectator at an animal fight has now increased from a Class C to a Class A misdemeanor. ■

For more information, please visit the CAIT website at www.vet.utk.edu/cait, or email us at CAIT@utk.edu, Teresa Jennings, CAIT Program Administrator.



The Homeless Connection, L to R: Teresa Jennings (CAIT Program Administrator), Laurel Johnson, Terri Lee James, Jayme Peck, Dr. Nancy Bohm, and Jan Yorke

HALT

By Candy Wansley, HALT President

“I didn’t think a dog could be so much like me,” commented one participant.

HALT (Humans and Animals Learning Together) is one of the special programs that UT’s College of Veterinary Medicine co-sponsors. Twice a year for four weeks, community volunteers help adolescent trainers from local residential treatment centers learn how to obedience train dogs. That is HALT in a nutshell, but the ramifications of the program are huge.

Dogs are selected from the Young-Williams Animal Center and the Oak Ridge Animal Shelter based upon their personality, temperament, health,



Wonderful dogs like Princess, Jackson, KC3, Little Bit, and Zinnia, all second chance dogs, are adopted into good, forever homes through HALT.



and age. Our HALT veterinarian Dr. John Shaw, CVM, ‘87, who also volunteers his time, monitors the dogs for at least 10 days prior to class and performs necessary medical procedures like vaccinations and flea/tick control. A local kennel, Catatoga Kennels, houses the dogs for HALT during the classes and is the location for classes. About 40 adult volunteers for each class cycle help ensure the success of the program.

The teens learn patience, responsibility, kindness, and empathy. They know that, through their work, these thrown-away dogs will be adopted to forever families. This fall’s HALT class topics range from pet overpopulation to necessary vet health care to training, bathing, and grooming. Hugging a dog who then showers you with affection, learning that dogs have emotional and physical needs just like teens do, these are core parts of the HALT experience. Can there be a more magic formula than working with kids and dogs? Animal assisted programs have proven time and again to benefit all involved: volunteers, recipients, and the animals. HALT is an important community outreach program with proven results, lots of smiling faces, and plenty of tail wagging. ■

HABIT

Caring for the public’s mental health

HABIT (Human-Animal Bond in Tennessee), now in its 21st year of operation, is a community group of volunteers working together to explore the circumstances and consequences of the human-animal bond and to promote this valuable relationship between people and animals.

Demand for HABIT visits continues to grow, and UTCVM plans to expand the HABIT program statewide to bring the benefits of companion animal visits to school reading programs and libraries as well as the sick and the elderly across Tennessee’s communities. Currently, there is a waiting list of schools in East Tennessee that would like to join the program, and HABIT would like to give every child that ‘reads’ with a HABIT dog a book at the end of the school year that has been ‘signed’ by the dog.

To learn more about HABIT, please go to www.vet.utk.edu/habit/. ■



HABIT volunteer dog, Cherokee, listens attentively to a young student reading in Mary Clark’s classroom at Boyds Creek Elementary School in Seymour, TN.



Building a larger, better-designed Small Animal Hospital to improve patient services and teaching at UTCVM



Hickory Construction, a local area licensed general contractor, began remodeling work to the existing 246,000 SF University of Tennessee Small Animal Clinic. The project scope comprises a new 27,000 SF two-story facility addition that will be used to treat small animals. The expanded area will provide larger, improved space for the oncology and oncology radiation programs, expanded physical therapy services space, and increased space for the avian, exotics and zoological animal clinical services. 10,655 SF of the new building area is unfinished second floor space that will support future growth.

Progress to date includes installing some 176 tons of fabricated structural steel, pouring 1000 cubic yards of concrete for the new linear accelerator vault (left), and coordinating concrete work for the new 8' x 16' therapy pool. The project is currently on schedule with a target completion slated for the end of December 2007.

"We are pleased with the fine progress that Hickory Construction is making; they are on schedule and are very responsible to the fulfillment of the contractual needs. Everyone has pulled together, and communications have been great, especially during the preliminary inspection of the linear accelerator vault. This is going to be a high-quality facility."

Dr. Bob DeNovo, Associate Dean for Administration and Clinical Programs

Help us help animals

Companion Animal Fund

Companion. Friend. Giver of unconditional love. To most pet owners, their pets are part of their family, a source of happiness and comfort – a true companion. Our companion animals are dependent on us to provide them with the best medical care possible, so that they may enjoy long, healthy lives.

Companion animal health studies at the University of Tennessee College of Veterinary Medicine are funded largely through private donations, unlike basic laboratory-based research funded by organizations like the National Institutes for Health. UTCVM's veterinary teaching hospital looks to the future needs of pets by educating veterinary students and conducting clinical research to develop new medical treatments for our companion animals.

By making a gift to the Companion Animal Fund, you can remember a beloved family pet and contribute toward vital clinical research into treatments and prevention of cancer, genetic diseases, feline leukemia, metabolic diseases and nutrition and other serious illnesses that remain as threats to the lives of our companion animals. All memorial gifts are acknowledged and recognized annually.

If you would like to make a memorial gift in tribute to your pet, please go to www.vet.utk.edu/giving, follow the giving directions there or email: celdridge@utk.edu.

Thank you on behalf of companion animals!



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